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Robustness and Reliability of Decentralized Stochastic Singularly-Perturbed Computer Controlled Systems with Multiple Time-Varying Delays

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Abstract

Robustness investigation and reliability investigation are discussed and investigated in this research for computer control of decentralized singularly-perturbed systems with multiple time-varying delays. Due to that the systems are controlled by using reduced-order control scheme, robustness of the system should be necessarily concerned. MATLAB can be applied to design program for the robustness bound of the systems. A reliability goal for the system is the stabilization of the plant by the controller in each control channel, such that the system can tolerate control channel failures. The results of the research show the system satisfy the required conditions to be a reliable control system.

Key words: Decentralized; Reliability; Robustness; Singularly-perturbed; Time-varying delays